A CULTURAL RESOURCES RECONNAISSANCE OF POSSIBLE DREDGE SPOIL DISPOSAL SITES, CHARLESTON HARBOR, SOUTH CAROLINA

Prepared for

SOUTH CAROLINA COASTAL COUNCIL

and

U.S. ARMY CORPS OF ENGINEERS- CHARLESTON

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ABSTRACT

Future operation of Charleston Harbor will require the continued dredging of navigation channels into and within the Harbor. Continued use existing disposal sites for dredged materials on Daniel Island will not be possible in the near future. Alternate disposal sites to replace the Daniel Island facilities are being sought by the U.S. Army Corps of Engineers and the South Carolina Coastal Council. This report provides an assessment of the potential for the construction, maintenance, and operation of 19 prospective locales on known or potential cultural resources. This assessment involved the identification of all known resources within or adjacent to the potential disposal sites, an assessment of the kinds of effects that the proposed facilities would create, and the ability of these effects to detract from the significance of any National Register of Historic Places listed, eligible, or potentially properties. A ranking system was developed to order the possible disposal sites with respect to their ability to affect cultural resources. This ranking can then be employed in the ongoing process of selecting the best site(s) for spoil disposal when all factors are considered.

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CHAPTER I

INTRODUCTION

Brockington and Associates, Inc., undertook an assessment of the potential effect of the construction and operation of nineteen possible dredge spoil disposal sites on cultural resources for the South Carolina Coastal Council and the U.S. Army Corps of Engineers, Charleston District. This assessment was undertaken to provide planning information for the selection of a disposal site(s) that will have optimal minimum effects on all environmental, cultural, and economic resources in the Charleston Harbor area.

Continued operation of Charleston Harbor for both commercial and military ship traffic requires the dredging of navigation channels into and within Charleston Harbor. Existing dredge spoil disposal sites on Daniel Island, located between the Cooper and Wando Rivers at the north center of the Harbor, will not be available in the near future. Use of alternate disposal sites will be necessary to maintain the current navigation ways and mooring facilities the Harbor. Nineteen potential disposal sites have been selected by the U.S. Army Corps of Engineers and the South Carolina Coastal Council as possible alternatives. These nineteen sites are located in and around the Harbor and include existing disposal sites in Charleston and Berkeley Counties, new upland and marsh sites in Charleston and Berkeley Counties, underwater disposal sites in the Harbor, and offshore disposal areas in both State and Federal waters. Figure 1 displays the location of each possible disposal site. Table 1 lists each site by name and describes its current setting and condition.

This report presents a brief description of the natural setting of the Charleston Harbor area and an overview of the cultural setting evidenced in the region in Chapter II. Chapter III presents a summary of the methods employed to gather information concerning cultural resources in or near the potential disposal sites, and to develop the ranking of sites by potential to affect these resources. Chapter IV summarizes the resources identified near each possible disposal site, describes the anticipated effects of the construction and operation of a disposal site, and provides an assessment of the potential of each possible disposal site to affect cultural resources. Chapter V presents a summary of the rankings of each possible disposal and presents recommendations based on the rankings developed in Chapter IV.


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North Charleston
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St Andrews
Mount Pleasant
Isle of Palms
Sullivans Island
CHARLESTON HARBOR
BERKELEY CO
CHARLESTON CO
FORT SUMTER NATL MON
PINE YORKTOWN STATE PARK

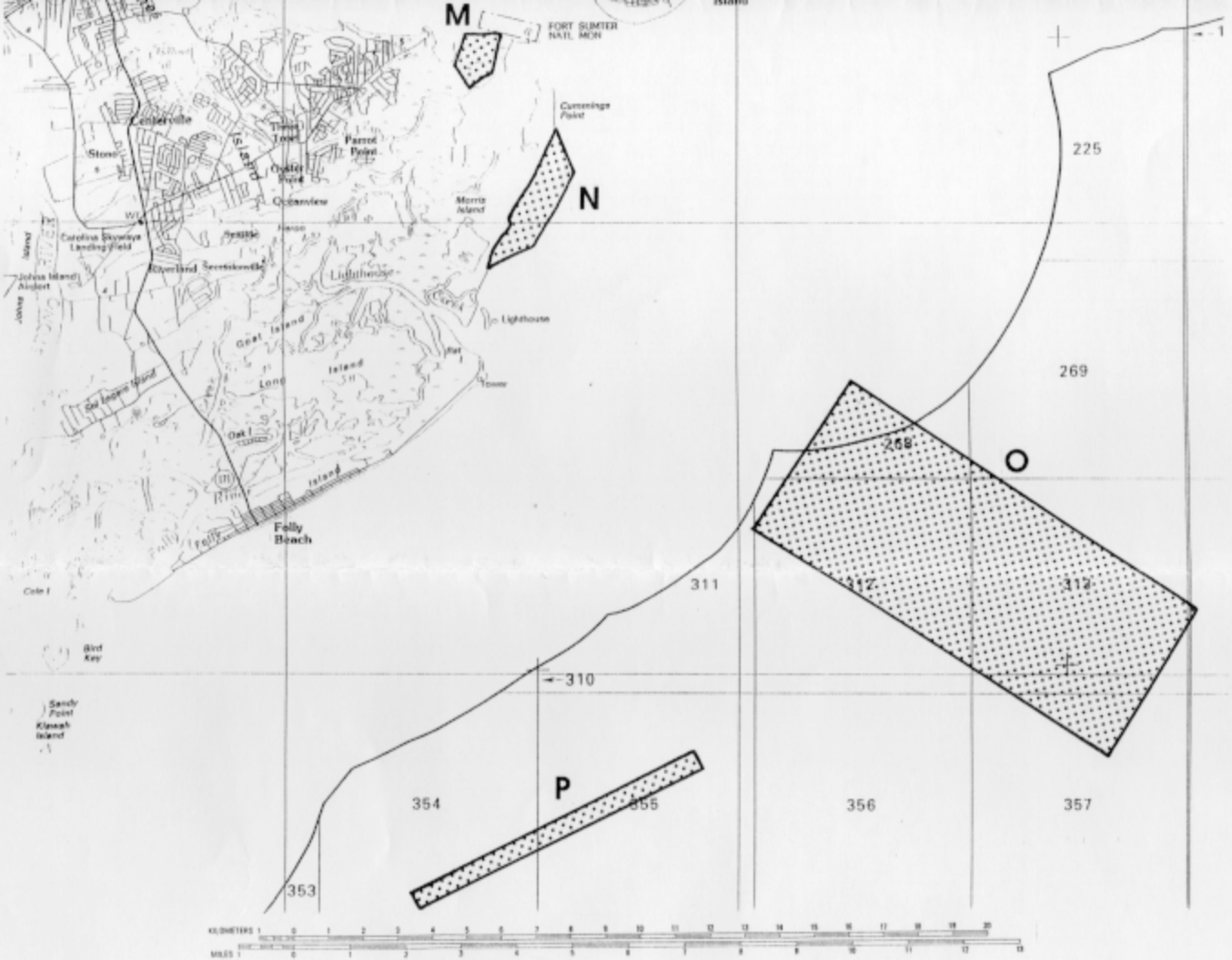

Figure 1. Charleston Harbor Region with the 19 possible disposal sites indicated.

Table 1. Summary of Possible Dredge Spoil Disposal Sites.

DISPOSAL SITE	NAME	PRESENT CONDITION/ CURRENT SETTING
A	Yellow House Creek	Existing disposal area on former marsh island
B	Naval Weapons Station	Existing disposal site on former marsh
C	TC Depot	Existing disposal site on former marsh
D	Upper Thomas Island	New location with 90% marsh and 10% upland
E	Clouter Creek	Existing disposal area on former marsh island
F	Lower Thomas Island	New location with 100% upland
G	Rodent Island	New location with 10% marsh and 90% upland
H	Parkers Island	New location with 100% upland
I	Old Landfill	Existing disposal area on filled marsh
J	Drum Island	Existing disposal area on former island
K	Patriots' Point	New location on existing dredge spoil
L	Middle Shoal	New location underwater in harbor
M	Fort Johnson	New location with 100% marsh
N	Morris Island	New location on beach
O	Ocean	Existing disposal area offshore
P	Folly Island Berm	New location offshore
Q	Cainhoy Road	New location with 100% uplands
R	Point Hope Island	New location with 100% uplands
S	Town Creek	New location underwater in harbor

CHAPTER II

NATURAL AND CULTURAL SETTING

THE CHARLESTON HARBOR REGION

Charleston Harbor occupies portions of central Charleston and southern Berkeley Counties, at the confluence of the Ashley, Cooper, and Wando Rivers (i.e., the Cooper River estuary, see Figure 1), in the Lower Coastal Plain of South Carolina. The Coastal Plain is characterized by a series of terraces formed by marine sediments deposited during the late Tertiary and Quaternary Periods. Most of the Charleston Harbor region lies on the most recent terraces (the Pamlico and the Talbot) that formed near the end of the Pleistocene Epoch (Long 1980:43).

Topography in the region generally consist of low ridges between the meandering channels of many streams that drain the Lower Coastal Plain. The ridges consist of sandy and loamy soils with more clayey soils and sediments occur in the drainages and marshes and swamps that border the streams. The coast above and below the Cooper River estuary consist of small to large barrier islands that form a portion of the Sea Island Complex in South Carolina (Kovacik and Winberry 1987:24). These low islands contain sandy uplands, derived from eolian and marine sediments generally dating from terminal Pleistocene or early Holocene fluctuations in sea level (i.e., the Pamlico Terrace described above). Networks of salt marshes, tidal flats, and small creeks have developed between the Sea Islands and the more interior landforms (Garrett 1983:7).

Although much of the Charleston Harbor region has been developed, extensive stands of maritime forest remain. Widmer (1976) presented a model of late prehistoric and early historic period vegetation patterns for the East Cooper area of Berkeley County. Widmer's model followed major vegetation types presented by Braun (1950), and included six major classes for that area:

Pine Savannah
Longleaf Pine Forest
Southern Mixed Hardwood Forest
Southern Hardwood Swamp
Freshwater Marsh
Tidal Marsh

Before intensive historic settlement and agricultural modification, the project tract probably contained a similar series of vegetation communities. Information on floral and faunal communities for the area is summarized from general sources such as Quarterman and Keever (1962) and Shelford (1963). Most of the extant woodlands today are mixed pine/hardwood forests. A mixed forest is more productive for faunal populations, and supports an active faunal community including deer and small mammals (e.g., various squirrels and mice, opossum, raccoon, rabbit, fox, skunk); birds (e.g., various songbirds,

ducks and wading birds, quail, turkey, doves, hawks, owls); and reptiles/amphibians (e.g., frogs, toads, lizards, snakes, turtles, alligator). Fresh and saltwater fish are abundant in the streams and marshes of the region, and shellfish are present in large numbers in most of the tidally affected wetlands throughout the region.

The climate of this area is subtropical, with mild winters and long, hot, and humid summers. The average daily maximum temperature reaches a peak of 80.1° F in July, although average highs are in the 80 degree range from May through September. A mean high of 46.8° F characterizes the coldest winter month, January. Average annual precipitation for Berkeley County is 47.3 inches, with most rain occurring in the summer months during thunderstorms; snowfall is very rare. The growing season averages 260 days, with first and last frosts generally occurring by November 2 and April 3, respectively. Although droughts do occur, they are rare, and the climate in general is very supportive of agriculture. Prevailing winds are light and generally from the south and southwest, although hurricanes and other tropical storms occasionally sweep through the area, particularly in the fall months (Long 1980:46,93-94).

Profound changes in climate and dependent biophysical aspects of regional environments have been documented over the last 20,000 years (the time of potential human occupation of the Southeast). Major changes include a general warming trend, melting of the large ice sheets of the Wisconsin glaciation in northern North America, and the associated rise in sea level. This sea level rise was dramatic along the South Carolina coast (Brooks et al. 1979), with an increase of as much as 100 meters during the last 20,000 years. At 10,000 years ago (the first documented presence of human groups in the region) the ocean was located from 50 to 100 miles east of its present position, and the project area was probably rather unremarkable Coastal Plain flatwoods. Sea level rise was steady from that time until about 5,000 years ago, when essentially modern levels were reached. During the last 5,000 years there has apparently been a 400 to 500 year cycle of sea level fluctuations of about two meters (Brooks et al. 1989; Colquhoun et al. 1981). Table 2 summarizes these more recent fluctuations in the region.

As sea level quickly (relatively) rose to modern levels, it altered the gradients of major rivers and flooded near-coast river valleys, creating estuaries like the Cooper-Ashley-Wando River mouths. These estuaries became great centers for salt water and freshwater resources, and thus population centers for human groups. Such dramatic changes certainly affected any human groups living in the region.

The general warming trend that led to the melting of glacial ice and the rise in sea level also greatly affected vegetation communities in the Southeast. During the late Wisconsin glacial period, until about 12,000 years ago, boreal forest dominated by pine and spruce covered most of the Southeast; by about 10,000 years ago, this forest was changing from coniferous to deciduous. The new deciduous forest was dominated by northern hardwoods such as beech, hemlock, and alder, with oak and hickory beginning to increase in number. With continuation of the general warming and drying trend, the oak and

Table 2. South Carolina Sea Level Curve Data.

CALENDAR DATE	SEA LEVEL	CONDITION
5,000 BC	6.5 m	In continuing rise
3,000 BC	4.5 m	Significant low stand
2,800 BC	1.5 m	High stand
2,500 BC	3.5 m	Low stand
2,200 BC	1.0 m	High stand
1,900 BC	3.2 m	Low stand
1,700 BC	0.8 m	Significant high stand
1,300 BC	4.0 m	Significant low stand
1,000 BC	1.0 m	High stand
800 BC	1.9 m	Low stand
600 BC	0.7 m	High stand
400 BC	3.0 m	Significant low stand
AD 300	0.4 m	High stand
AD 600	0.6 m	Low stand
AD 900	0.4 m	High stand
AD 1300	1.2 m	Low stand
AD 1989	0.0 m	In continuing rise

Data are interpolated from Brooks et al. (1989). Sea level is in meters below present high marsh surface.

hickory came to dominate, along with southern species of pine; oak and hickory appear from pollen data (Whitehead 1965, 1973; Watts 1970, 1980) to have reached a peak at 7000 to 5000 years ago. Since that time, the general climatic trend in the Southeast has been toward slightly cooler and moister conditions, and the present Southern Mixed Hardwood Forest as defined by Quarterman and Keever (1962) has become established.

Faunal communities also changed dramatically during this time. A number of dominating mammal species (e.g., mammoth, mastodon, horse, camel, giant sloth) became extinct at the end of the glacial period 12,000 to 10,000 years ago. Prehistoric human groups, which for subsistence had focused on hunting these large mammals, readapted their strategy to exploitation of smaller mammals, primarily deer in the Southeast.

PREHISTORIC CULTURAL OVERVIEW

The prehistory of coastal South Carolina has received much attention from archaeologists, and the present interpretations of that prehistory are presented in this section. Readers are directed to Anderson (1977), and Anderson and Logan (1981) for detailed overviews of previous research in the region. The following summary discussion is divided into periods which represent distinct cultural adaptations in the region; environmental changes that occurred in each period are also described.

Paleoindian Period (10000 - 8000 BC)

The earliest presence of man in the Coastal Plain of South Carolina occurred in the Paleoindian Period. This cultural period corresponds with the terminal Pleistocene, when climate was generally much colder than today, and when sea level was more than 200 feet below present levels. Although the project area was in the Coastal Plain during the Paleoindian Period, the distance to the ocean was much greater than at present. Another notable feature of the terminal Pleistocene was the presence of large mammalian species (i.e., megafauna).

The pattern of human adaptation for this period has been reconstructed from data from other areas of the country and from distributional data on diagnostic fluted projectile points found within the Southeast (Anderson 1990a). While many Paleoindian sites have been excavated in the Southeast (Anderson 1990b:174), only recently have South Carolina sites received attention. However, the data from surface finds of Paleoindian points seem to indicate that cultures of this period were focused along major river drainages, especially in terrace locations (Goodyear et al. 1989; Michie 1977; Goodyear 1979; Anderson and Logan 1981:13). If the pattern from other areas of the country holds true in South Carolina, then the adaptation was one of broad range, high mobility hunting and gathering with a possible focus on megafauna exploitation (Gardner 1974).

Paleoindian points have been recovered in the lower Coastal Plain (Goodyear et al. 1989; Michie 1977), but no intact sites have been documented. Apparently, only minimal Paleoindian use of the region occurred; populations were probably centered more on the coast, which was farther east at that time. The project area lacks the cryptocrystalline raw materials favored by the Paleoindian knappers (Goodyear et al. 1989; Goodyear 1979), and there are no known examples of Paleoindian projectile points produced using the locally available orthoquartzite.

Early Archaic Period (8000-6000 BC)

The Early Archaic corresponds to the adaptation of native groups to Holocene conditions. The climate in coastal South Carolina during this period was still colder and moister than at present, but an oak-hickory forest was establishing itself on the Coastal Plain (Whitehead 1965, 1973; Watts 1970, 1980). At this time, the woodland flora and fauna had become established. The Early Archaic adaptation in the South Carolina Lower Coastal Plain is not clear, as Anderson and Logan (1981:13) report:

> At the present, very little is known about Early Archaic site distribution, although there is some suggestion that sites tend to occur along river terraces, with a decrease in occurrence away from this zone.

Early Archaic finds in the Lower Coastal Plain are most typically corner- or side-notched projectile points, which have been determined to be Early Archaic through comparison with materials excavated at sites in other areas of the Southeast (Coe 1964; Claggett and Cable 1982).

Anderson and Hanson (1988) have offered a model of seasonal mobility for Early Archaic groups in South Carolina, which posits bands of 50 to 150 people along major drainage systems. The Charleston Harbor region is located within their Saluda/Broad band. Anderson and Hanson (1988) hypothesize that Early Archaic use of the Lower Coastal Plain was limited to seasonal (springtime) foraging camps and logistical camps; aggregation camps and winter base camps are hypothesized to have been near the Fall Line. Given the low overall population density, limited evidence of Early Archaic occupation is expected in the region.

Middle Archaic and Preceramic Late Archaic Period (6000-2500 BC)

The trends initiated in the Early Archaic (i.e., increased population and adaptation to local environments) continued through the Middle Archaic and Preceramic Late Archaic. Climatically, the study area was still warming, and an oak-hickory forest dominated the coast until circa 2000 BC, when pine became more prevalent (Watts 1970, 1980). Sites increased in size and density through the period, and stemmed projectile points and ground stone

tools are characteristic artifacts. Koob (1976) reported several sites from this period in Charleston and Berkeley Counties, generally represented by surface scatters of projectile points and flakes in plowed fields.

Blanton and Sassaman (1989) have recently reviewed the archaeological literature on the Middle Archaic Period. They document an increased simplification of lithic technology through this period, with increased use of expedient, situational tools. Furthermore, they argue that the use of local lithic raw materials is characteristic of the Middle and Late Archaic. Blanton and Sassaman (1989:68) conclude that "the data at hand suggest that Middle Archaic populations resorted to a pattern of adaptive flexibility as a response to" mid-Holocene environmental conditions such as "variable precipitation, sea level rise, and differential vegetational succession." These processes resulted in changes in the types of resources available changing from year to year.

Ceramic Late Archaic Period (2500-1500 BC)

By the end of the Late Archaic Period, two developments had occurred which changed the prehistoric lifeways on the South Carolina Coastal Plain. First, sea level had risen to within one meter of present levels, and the extensive estuaries now present were in place (Colquhoun et al. 1981). These estuaries were a reliable source of shellfish, and the Ceramic Late Archaic Period saw the first documented emphasis on shellfish exploitation. The second major development was the invention or adoption of pottery on the South Carolina coast.

It should be noted that the temporal/cultural border between the Ceramic Late Archaic and the Early Woodland has been subject to much discussion. Trinkley (1989, 1990) has recently argued that the Woodland Period begins with pottery production, and that there is no Ceramic Late Archaic. In contrast, Anderson et al. (1982) argue that the Ceramic Late Archaic is recognizable by either Stallings or Thom's Creek pottery. In the chronology presented in Table 3, the line is drawn circa 1500 BC, a time when production of fiber tempered pottery (Stallings) ceases, and a time when coastal midden sites change from large shell rings to smaller, dispersed middens. Unfortunately for regional researchers, there is not a direct equation between ceramic manifestation and cultural adaptation; Thom's Creek was a long lived tradition which spanned a period of major cultural and environmental change. When Thom's Creek pottery was produced within a generally Archaic system (Stallings and Thom's Creek I phases), it is considered a Ceramic Late Archaic manifestation. Subsequently, when Thom's Creek (and then Refuge) ware was produced within a more typically Woodland system, it entered the Early Woodland Period. Thom's Creek pottery has been recovered from two sites on Daniel Island (Trinkley and Tippett 1980:95).

As mentioned earlier, the Ceramic Late Archaic evidences the first archaeologically documented use of shellfish. In addition to the impressive shell ring sites of the South

Table 3. Regional Ceramic Sequence.

PERIOD	PHASE	DATE SPAN	CERAMIC TYPES
PROTOHISTORIC	Ashley [1]	AD 1550 - 1715	Ashley Complicated Stamped Mississippian Plain
LATE MISSISSIPPIAN	Pee Dee [1]	AD 1400 - 1550 [2]	Pee Dee Complicated Stamped Mississippian Plain
EARLY MISSISSIPPIAN	Jeremy [1]	AD 850 - 1400[3]	Savannah Complicated Stamped var Jeremy Savannah Check Stamped Burnished and Semi-Burnished Plain
LATE WOODLAND	Santee I	AD 700 - 850	Santee Simple Stamped [4] Deptford Fabric Impressed McClellanville Fabric Impressed [5] McClellanville Cord Marked [5] Wilmington Cord Marked
	McClellanville	AD 500 - 700	Deptford Cord Marked [6] Deptford Fabric Impressed [6] McClellanville Fabric Impressed McClellanville Cord Marked Wilmington Fabric Impressed Wilmington Heavy Cord Marked
MIDDLE WOODLAND	Deptford III	AD 200 - 500	Deptford Linear Check Stamped Deptford Simple Stamped Deptford Cord Marked Deptford Fabric Impressed Wilmington Heavy Cord Marked Wilmington Fabric Impressed Wilmington Check Stamped
	Deptford II	200 BC - AD 200	Deptford Linear Check Stamped Deptford Simple Stamped Hanover Fabric Impressed [7] Hanover Cord Marked [7] Yadkin Linear Check Stamp [8] Yadkin Fabric Impressed [8] Yadkin Cord Marked [8]
EARLY WOODLAND	Deptford I [9]	800 BC - 200 BC	Deptford Linear Check Stamped Deptford Simple Stamped Hanover Fabric Impressed Hanover Cord Marked
	Thom's Creek II [10]	1500 BC - 800 BC	Thom's Creek Plain Thom's Creek Reed Punctate Thom's Creek Jab and Drag Thom's Creek Shell Punctate Thom's Creek Simple Stamped Thom's Creek Incised Thom's Creek Finger Pinched Refuge Punctate Refuge Dentate Stamped Refuge Plain Refuge Simple Stamped Refuge Incised
LATE ARCHAIC [11]	Thom's Creek I	2000 BC - 1500 BC	Thom's Creek Plain Thom's Creek Reed Punctate Thom's Creek Jab and Drag Stallings Plain
	Stallings	2500 BC - 2000 BC	Stallings Plain

NOTE: The bracketed numbers refer to notes contained on the second page of this table. **SOURCES:** Anderson (1989, 1990a); Anderson et al. (1982); Blanton et al. (1986); Cable et al. (1991); Espenshade and Brockington (1989); South (1976); Trinkley (1981a, 1981b, 1989, 1990).

Table 3 Notes.

[1]. Detailed studies of large Mississippian site collections will eventually allow greater refinement of Mississippian chronology (see Cable et al. 1991:83).

[2]. The transition date from Savannah Comp Stamped var. Jeremy to Pee Dee is not well established; it is based on rim treatment chronologies from other areas (e.g., DePratter and Judge 1990).

[3]. A series of four radiocarbon dates from Buck Hall (38CH644) indicate that Mississippian Complicated Stamped pottery (Savannah, var. Jeremy) was present in the Forest by AD 850 (Poplin et al. 1992).

[4]. Research at Buck Hall (38CH644) indicates that Santee Simple Stamped was not contemporaneous with Savannah Complicated Stamped var. Jeremy (Poplin et al. 1992).

[5]. McClellanville textile decorate types may actually fall within the same technological series as Santee Simple Stamped, as defined by Anderson et al. (1982). Because of apparent temporal differences, the McClellanville/Santee split should be maintained until large samples can be examined. The McClellanville types, as applied here, refer to a paste with fine to medium sand aplastics (Trinkley 1981a).

[6]. The type designations, Deptford Cord Marked and Deptford Fabric Impressed, should replace the Cape Fear, Deep Creek, and Deptford/Deep Creek types now in use. Detailed ceramic analyses at Mattassee Lake (Anderson et al. 1982) and Minim Island (Espenshade and Brockington 1989) have demonstrated that these textile impressed types were produced on a paste technologically identical to the local Deptford series manifestations. Furthermore, the cord marked and fabric impressed decorative modes represent the incorporation of extralocal surface decorations into the established technological tradition. These additions were temporally and culturally significant; the placement of these types within the Deptford series reflects this significance.

[7]. The Hanover series is here separated from the Wilmington series, in contrast to their lumping at Mattassee Lake (Anderson et al. 1982). The Hanover series is demonstrably earlier than the Wilmington series (Blanton et al. 1986:13), and the splitting will facilitate a more complete understanding of cultural dynamics. It is unclear at this point if the two series can consistently be sorted; it appears that interior finish details (lumpy/cracked vs. well smoothed) can be utilized in distinguishing the two.

[8]. Recent radiocarbon dates (Blanton et al. 1986:12) indicate a tighter date range for Yadkin series pottery than originally posited by Anderson et al. (1982).

[9]. Deptford series ceramics appeared as the majority ware in contexts at Minim Island which were dated to circa 780 BC (Espenshade and Brockington 1989), in agreement with the chronologies offered by Trinkley (1989) and Anderson et al. (1982).

[10]. The inclusion of Refuge ware in the Thom's Creek II phase is supported by the radiocarbon assays from the testing (Drucker and Jackson 1984) and data recovery (Espenshade and Brockington 1989) excavations at the Minim Island Site. Refuge and Thom's Creek wares were shown to have co-occurred at Minim Island from circa 1440 BC through 1100 BC.

[11]. The Late Archaic/Early Woodland division has been widely debated. Trinkley (1989, 1990) recently suggested that the Woodland Period began with the first production of fiber tempered pottery, while Anderson et al. (1982) that both Thom's Creek and Stallings manifestations are Late Archaic. The recent data on (late) Thom's Creek and Refuge contemporaneity at Minim Island suggest that the presence of Thom's Creek ware does not indicate a Late Archaic affiliation. The problem is that Thom's creek pottery span a period in which there were major changes in the environment and cultural adaptations. For the current chronology, it is argued that the Late Archaic label should be applied to the period in which fiber tempered pottery was produced and in which shell rings were occupied (i.e., the Stallings and Thom's Creek I phases), 2,500 to 1,500 BC. A true Woodland adaptation apparently evolved in the subsequent Thom's Creek II phase, which is here considered the beginning of the Early Woodland Period.

Carolina and Georgia coasts (Griffin 1945; Hemmings 1970; Waring 1968), sites of the Ceramic Late Archaic also include the following: small shell middens apparently derived from a single household; shell-less sites of the interior coastal area; extremely ephemeral sites represented by a few diagnostic sherds; and major base camp/village sites of the Fall Line region (e.g., the Thom's Creek site, Griffin 1945).

The best known Ceramic Late Archaic sites are the shell rings which are relatively frequent along the tidal marsh between Charleston and Georgetown. This site type also occurs further to the south, along the Georgia and Florida coasts (Marrinan 1975; Trinkley 1990). These rings are usually round or oval rings of shell and other artifacts, with a relatively sterile area in the center. Many of these rings are currently in tidal marsh waters; they have been interpreted as actual habitation loci adjacent to or within productive shellfish beds (Trinkley 1985). These sites attest to a high degree of sedentism, at least on a seasonal basis.

Early Woodland Period (1500 - 200 BC)

The Early Woodland Period was a time when sea level climbed slowly and irregularly to within 1.0 m of current levels. The period effectively begins and ends with significant low stands within the general rising trend; the 1400 BC low stand was 4.0 m below present high marsh surface [bphms], and the 300 BC low stand was 2.9 m bphms (Brooks et al. 1989). The subsistence and settlement pattern of the Early Woodland Period suggests population expansion, and the movement of groups into areas which had been only minimally used in earlier periods. Early Woodland sites are very common on the South Carolina coast, and generally consist of shell middens near tidal marshes, and ceramic and lithic scatters in a variety of environmental zones. Non-shell sites have also been recognized (Trinkley 1982, 1990). It appears that group organization during this period was based on the semi-permanent occupation of shell midden sites, with the short-term use of interior Coastal Strand sites.

Ceramic typology allows the definition of two phases within the Early Woodland Period; the Thom's Creek II phase and the Deptford I phase. The Thom's Creek II phase (1500 - 800 BC) is recognized by the presence of a wide variety of Thom's Creek (untempered or fine-to-medium sand tempered) and Refuge (coarse sand temper) types. Evidence from testing (Drucker and Jackson 1984) and data recovery excavations (Espenshade and Brockington 1989) at Minim Island show that Thom's Creek and Refuge were separate, distinct, and contemporaneous wares from circa 1440 through 1100 BC.

The second phase of the Early Woodland Period is Deptford I (800 - 200 BC), recognized by the presence of Deptford (coarse to very coarse sand temper) and Hanover (grog tempered) ceramics. While Deptford Check Stamped and Deptford Simple Stamped were also produced in the subsequent Middle Woodland, the general lack of other Deptford types marks the Deptford I phase, i.e., only Deptford Simple Stamped and Deptford Check

Stamped are present in the Deptford series of Deptford I. In the region, Deptford is the dominant ware in Deptford I sites, and many sites are characterized by only Deptford Check Stamped and Plain pottery.

The Hanover Fabric Impressed and Hanover Cordmarked pottery are here discussed as a distinct series, rather than as a variety within the Wilmington (also grog tempered) series, as suggested by Anderson et al. (1982). The published radiocarbon dates (as summarized in Blanton et al. 1986) for Hanover wares range from 180 BC to 250 AD, with most clustering around 150 BC. In contrast, the earliest published radiocarbon date for Wilmington material is 400 AD, with dates of 600 to 1000 AD most common. Given this temporal discontinuity, it is argued here that Hanover and Wilmington are best treated as separate series. Although detailed type descriptions have not been provided for Hanover material (cf. South 1976), the mode of interior finishing may allow sorting of the two series. Hanover pottery characteristically has a lumpy interior, with cracks common as the general ceramic body separated from the large grog fragments. Wilmington vessels, in contrast, most commonly have well-smoothed interiors, lacking grog cracking. While these differences have not been verified through a detailed comparison of well dated Hanover and Wilmington materials, the separation (rather than combination) of the two series has the greater potential for providing meaningful temporal, spatial, and cultural insight.

Middle Woodland Period (200 BC - AD 500)

The extreme sea level fluctuations which marked the Ceramic Late Archaic and Early Woodland periods ceased during the Middle Woodland Period. The Middle Woodland Period began as sea level was rising from a significant low stand at 300 BC, and for the majority of the period the sea level remained within 1.0 m of current levels (Brooks et al. 1989). The comments of Brooks et al. (1989:95) are pertinent in describing the changes in settlement:

> It is apparent that a generally rising sea level, and corresponding estuarine expansion, caused an increased dispersion of some resources (e.g., small inter-tidal oyster beds in the expanding tidal creek network ...). This hypothesized change in the structure of the subsistence resource base may partially explain why these sites tend to be correspondingly smaller, more numerous, and more dispersed through time.

Survey and testing data from the a number of sites in the region clearly indicate that Middle Woodland Period sites are most frequently encountered throughout region. These sites include small, single house, shell middens (e.g. 38CH1047 [Espenshade 1989]); more significant shell middens (e.g., possibly Loci A and B at 38CH317 [Cable 1990]); and a wide variety of shell-less sites of varying size and density in the interior.

The present data from the region suggest seasonal mobility, with certain locations

revisited on a regular basis (e.g., 38GE46 [Espenshade and Brockington 1989]). Subsistence remains indicate that oysters and estuarine fish were major faunal contributors, while hickory nut and acorn have been recovered from ethnobotanical samples (Espenshade and Brockington 1989; Drucker and Jackson 1984; Trinkley 1976, 1980).

The Middle Woodland Period witnessed increased regional interaction, and saw the incorporation of extralocal ceramic decorative modes into the established Deptford technological tradition. As Caldwell (1958) first suggested, the period apparently saw the expansion and subsequent interaction of groups of different regional traditions (Espenshade 1986, 1990).

The Deptford II phase (200 BC - AD 200) saw the continued production of Deptford Check Stamped, Deptford Simple Stamped, Hanover Fabric Impressed, and Hanover Cordmarked pottery. In addition, pottery of the Yadkin (coarse to granular crushed quartz temper) series appears during this phase. The Hanover and Yadkin material are only minimally represented on sites of this phase, with Deptford wares continuing to be dominant.

In the Deptford III phase (AD 200 - 500), the cord marked and fabric impressed decorative modes of the Northern and Middle Eastern traditions begin to be produced on the established Deptford technological tradition. While these manifestations (i.e., fabric impressed or cord marked pottery with a coarse to very coarse sand paste) have been formerly termed Cape Fear (Anderson et al. 1982), Deep Creek (Trinkley 1989, 1990), or Deptford/Deep Creek, they are designated as Deptford types here to reflect the shared technological tradition. In other words, Deptford Cordmarked and Deptford Fabric Impressed were being made at the same time and in a technologically identical manner to Deptford Check Stamped and Deptford Simple Stamped pottery. These extralocal surface decorations were being produced on a local paste tradition, and the use of extralocal series names such as Deep Creek or Cape Fear is confusing and misleading.

Late in the Deptford III phase, Wilmington ware makes its first appearance. Cord marked, fabric impressed, and check stamped (very rare) types are present on the grog tempered paste.

Late Woodland Period (AD 500 - 900)

The nature of Late Woodland adaptation in the region is unclear due to a general lack of excavations of Late Woodland components, but Trinkley (1989:84) offers this summary:

> In many respects the South Carolina Late Woodland may be characterized as a continuation of previous Middle Woodland cultural assemblages. While outside the Carolinas there were major cultural changes, such as the

> continued development and elaboration of agriculture, the Carolina groups settled into a lifeway not appreciably different from that observed for the past 500 to 700 years.

The Late Woodland represents the most stable prehistoric period in terms of sea level change, with sea level for the entire period between 0.4 and 0.6 m bphms (Brooks et al. 1989). It would be expected that this general stability in climate and sea level would have resulted in a well entrenched settlement pattern, but the data are not available to address this expectation.

In fact, the recognition/interpretation of Late Woodland adaptations in the region has been somewhat hindered by past typological problems. The revised chronology uses two of the phases defined by Anderson et al. (1982): McClellanville (AD 500 to 700) and Santee I (AD 700 to 900). The Late Woodland overall is noteworthy for its lack of check stamped pottery. The McClellanville phase saw the continued production of Deptford Cordmarked, Deptford Fabric Impressed, and Wilmington Fabric Impressed pottery. Another pottery manifestation which first appears in this phase is the McClellanville series. Defined by Trinkley (1981a) from samples from the Walnut Grove Site (38CH260), McClellanville types are characterized by a paste with fine to medium sand aplastics. The McClellanville Fabric Impressed and McClellanville Cordmarked types may be technologically related to the later Santee series (Anderson et al. 1982), but this relationship has not been clearly defined. At present, it is reasonable to utilize two series until adequate samples of both series can be studied in detail.

The Santee I phase (AD 700 to 900) is characterized by the same pottery produced in the preceding phase, with the notable addition of Santee Simple Stamped pottery. The Santee Simple Stamped type (fine to medium sand aplastics) is overwhelmingly dominant on sites of this phase, with the other types only minimally represented.

Early Mississippian Period (AD 900 - 1200)

In much of the Southeast, the Mississippian Period was a time of major mound ceremonialism, regional redistribution of goods, chiefdoms, and maize horticulture as a major subsistence activity. It is unclear how early and to what extent similar developments occurred in the region. The ethnohistoric record, discussed in greater detail below, certainly indicates that seasonal villages and maize horticulture were present in the area, and that significant mound centers were present in the interior Coastal Plain to the north and west (Ferguson 1971, 1975; Anderson 1989; DePratter 1989). Anderson (1989:115) noted:

> One thing is emerging from recent work, and that is that characteristically Mississippian complicated stamped ceramics do not appear until at least A.D. 1100, and probably not until as late as A.D. 1200, over much of the South Carolina area. Whether this means that the Mississippian adaptation itself,

specifically the adoption of intensive agriculture within the context of hierarchical ranked society, occurred earlier remains unknown.

Three Mississippian phases, corresponding to Early, Middle, and Late Mississippian periods, have been recognized for the region (Anderson et al. 1982; Anderson 1989). Cable (1990) has suggested that refinement should be feasible within these broad phases, such as DePratter and Judge (1990) have attempted for the Wateree River basin. However, the current data base supports only these three phases: Santee II (AD 900 - 1200); Jeremy (AD 1200 - 1400); and Pee Dee (AD 1400 - 1550).

The Early Mississippian Santee II phase has been defined by the presence of Santee Simple Stamped, McClellanville Cordmarked, McClellanville Fabric Impressed, and Wilmington Cordmarked pottery (Anderson et al. 1982). However, Poplin et al. (1992) report complicated stamped wares similar to Savannah Complicated Stamped occurring during this phase. Radiocarbon dates from the Buck Hall Site (Poplin et al. 1992:278), ranging from AD 847 through AD 1020, place these ceramics within the previously defined Santee I and Santee II phases. Deptford Cordmarked and Deptford Fabric Impressed pottery were not produced in the Mississippian periods.

Sites of the Santee II phase in the region include large shell middens, such as 38CH260 (Trinkley 1981a); sites with apparent multiple, single house shell middens, such as 38CH146 and 38CH426 (Espenshade 1989); and multiple small shell middens, such as 38CH644 (Poplin et al. 1992). Adaptation during this period apparently saw a continuation of the generalized Woodland hunting-gathering-fishing economy, with perhaps a growing importance on horticulture and storable food stuffs. Anderson (1989) has suggested that environmental unpredictability premised the organization of hierarchical chiefdoms in the Southeast beginning in the Early Mississippian Period; the redistribution of stored goods (i.e., tribute) probably played an important role in the Mississippian social system. Maize was recovered from a feature suggested to date to the Early Mississippian Period from 38BK226, near St. Stephen (Anderson et al. 1982:346).

Middle Mississippian Period (AD 1200 - 1400)

The material culture of this phase includes the following ceramic types: Savannah Complicated Stamped, Savannah Check Stamped, Savannah Fine Cordmarked, and Santee Simple Stamped. The Santee Simple Stamped was a minority ware in this phase, and the assemblage was very similar to classic "Mouth of the Savannah River" Middle Mississippian (DePratter 1979).

Middle Mississippian Jeremy phase sites in the region include isolated single house shell middens (e.g., 38CH1048 [Espenshade 1989]), multiple shell midden sites (e.g., 38CH260 [Trinkley 1981a], 38CH300 [Trinkley 1981b], 38CH1116, and Moore's Landing in the Cape Romain Wildlife Refuge [Anderson and Claggett 1979a, 1979b]), shell-less ceramic